KEY

L17&18 – 5.4 Factoring Special Trinomials and 5.5 Polynomial Problem Solving

Part 1: Factoring Review (a=1)

Factor the following:

$x^2 + 8x + 15$

+3 +5
□+□ = 8
□×□ = 15

1,15
3,5

$\downarrow$

$(x+3)(x+5)$

$x^2 - 12x + 35$

-5 -7
□+□ = -12
□×□ = 35

1,35
5,7

$\downarrow$

$(x-5)(x-7)$

Part 2: Factoring Review (a>1)

Factor the following:

$2x^2 + 13x + 15$

+3 +10
□+□ = 13
□×□ = 30

1,30
2,15
3,10
5,6

$\downarrow$

$2x^2+3x+10x+15$

$(2x^2+3x)+(10x+15)$

$x(2x+3)+5(2x+3)$

$(2x+3)(x+5)$

$6x^2 + 11x - 10$

-4 +15
□+□ = 11
□×□ = -60

1,60
2,30
3,10
4,15
5,12
6,10

$\downarrow$

$6x^2-4x+15x-10$

$(6x^2-4x)+(15x-10)$

$2x(3x-2)+5(3x-2)$

$(3x-2)(2x+5)$

Part 3: Factoring Special Polynomials – No Middle Term

Factor the following:

$x^2 - 25$

$x^2+0x-25$

+5 -5
□+□ = 0
□×□ = -25

$\downarrow$

$(x+5)(x-5)$

EASIER

$\sqrt{x^2} = x$

$\sqrt{25} = 5$

$\downarrow$

$(x+5)(x-5)$

Check!

$4x^2 - 49$

$4x^2+0x-49$

+14 -14
□+□ = 0
□×□ = 196

$\downarrow$

$4x^2+14x-14x-49$

$(4x^2+14x)+(-14x-49)$

$2x(2x+7)-7(2x+7)$

$(2x+7)(2x-7)$

EASIER

$\sqrt{4x^2} = 2x$

$\sqrt{49} = 7$

$\downarrow$

$(2x+7)(2x-7)$

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Part 4: Factoring Special Polynomials – Perfect Squares

Factor the following:

$x^2 + 10x + 25$ $\quad +5\ +5$, $\square+\square=10$, $\square\times\square=25$

$(x+5)(x+5)$

EASIER: $\sqrt{x^2}=x$, $\sqrt{25}=5$ $\Rightarrow (x+5)(x+5)$ Check

$x^2 - 10x + 25$ $\quad -5\ -5$, $\square+\square=-10$, $\square\times\square=25$

$(x-5)(x-5)$

EASIER: $\sqrt{x^2}=x$, $\sqrt{25}=5$ $\Rightarrow (x-5)(x-5)$ Check

Part 5: Factoring Special Polynomials with "y" terms

Factor the following:

$4x^2 - 9$ $\quad \sqrt{4x^2}=2x$, $\sqrt{9}=3$

$(2x+3)(2x-3)$

Check!

$4x^2 - 9y^2$ $\quad \sqrt{4x^2}=2x$, $\sqrt{9y^2}=3y$

$(2x+3y)(2x-3y)$

Check!

Part 6: Factoring Special Polynomials with Common Factors

Factor the following:

$-x^2 + 49$

$-1(x^2-49)$ $\quad \sqrt{x^2}=x$, $\sqrt{49}=7$

$-1(x+7)(x-7)$

$8x^2y - 162y^3$

$2y(4x^2-81y^2)$ $\quad \sqrt{4x^2}=2x$, $\sqrt{81y^2}=9y$

$2y(2x+9y)(2x-9y)$

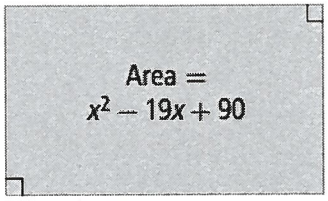
Part 7: L17 Textbook Practice

Page 246 #1-8 (pick two) and 11

KEY

Part 8: Areas of Shapes

Use the following information to answer Q1-Q2:



Q1: The length of the rectangle can be expressed as $(x - a)$ and the width as $(x - bc)$, where ***a, b,*** and ***c*** are ___, ___ and ___.

*(Record your **three digit** answer in the Numerical Response boxes below)*

9	1	0	

$x^2 - 19x + 90$

$(x - 9)(x - 10)$

$a = 9,\ b = 1,\ c = 0$

$-9 \quad -10$

$\square + \square = -19$

$\square \times \square = 90$

Q2: If x=11 cm, what is the perimeter of the rectangle, in cm^2?

*(Record your **three digit** answer in the Numerical Response boxes below)*

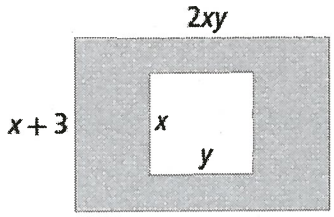
6	.	0	0

$x - 9 = (11) - 9 = 2$

$x - 10 = (11) - 10 = 1$

$P = L + W + L + W$
$= 2 + 1 + 2 + 1$
$= 6$
$= 6.00$

Use the following information to answer Q3:



Q3: *(Long Answer)* Write and expression in fully factored form for the shaded area. *(4 marks)*

Big rectangle = $(2xy)(x+3) = 2x^2y + 6xy$

Small rectangle = $(x)(y) = xy$

Total = Big − Small

$= (2x^2y + 6xy) - (xy)$

$= 2x^2y + 5xy$

Area $= xy(2x + 5)$

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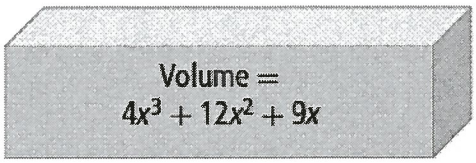
Use the following information to answer Q4-5:



Q4: *(Long Answer)* Write an algebraic expression for the dimensions of the rectangular prism. *(2 marks)*

$4x^3 + 12x^2 + 9x$

$\times (4x^2 + 12x + 9)$

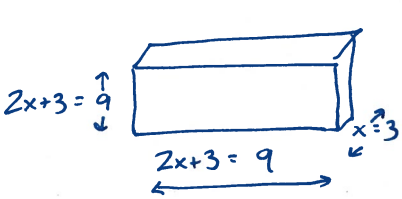
$\times (2x+3)(2x+3)$

$\sqrt{4x^2} = 2x$

$\sqrt{9} = 3$

Check!

Q5: *(Long Answer)* Calculate the surface area of x = 3 cm. *(2 marks)*



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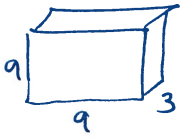

Front: $9 \times 9 = 81$
Back: $= 81$
Right: $3 \times 9 = 27$
Left: $= 27$
Top: $9 \times 3 = 27$
Bottom: $= 27$

$SA = 270 cm^2$

Part 9: L18 Textbook Practice

Pg. 222 #14, 16
Pg. 234 #15
Pg. 246 #14, 17, 18